Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

Development Status and Trend of the Whole Process Engineering Consulting

Hanzheng Shi[1], Ruiling Zhang[2,*], Pengwen Xie[2]
[1]China Academy of Industrial Internet, Beijing 100102, China
[2]Henan Oilfield Engineering Technology Co., Ltd., Zhengzhou 454000, China
*Corresponding Author.

Abstract:
The global economy has entered an important period of digital transformation, all walks of life are in full swing, and the transformation and upgrading of traditional industries has been triggered. The whole process of development consulting is the embodiment of the industry's implementation of the new development concept and the specific measures to implement the supply side structural reform in the consulting field. This paper analyzes the development status of the whole process engineering consulting industry, puts forward the research conclusions of the whole process engineering consulting trend, summarizes the existing problems in the development of the whole process engineering consulting industry. This paper suggested that the government issue binding measures, formulate technical standard system and management standard system to meet the needs of the whole process of engineering consulting services, and provide policy support for the whole process of consulting. The analysis results have guiding significance for the development of whole process engineering consulting in China. The whole process engineering consulting service will become the development trend of engineering consulting in the future with its advantages of integration, specialization and diversification.
Keywords*: Whole process engineering consultation, Development status,Trend research, Problems and Countermeasures*

I. INTRODUCTION

The whole process engineering consultation refers to the continuous provision of local or overall solutions and management services for project decision-making, implementation and operation by using a variety of service combinations[1]. Compared with the traditional engineering consulting, it has the characteristics of strong comprehensiveness, large stage span and consulting integration. This innovation in the traditional engineering consulting mode is not only the embodiment of the industry's implementation of the new development concept under the condition of high-quality development of engineering construction, but also a specific measure to implement the supply side structural reform in the consulting field[2]. The whole process engineering consulting seeks to realize the change of service quality, efficiency and power through the improvement of consulting efficiency and value.

Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

II. DEVELOPMENT STATUS of WHOLE PROCESS ENGINEERING CONSULTING INDUSTRY

In recent years, the whole process of engineering consultation has experienced different stages, such as concept proposal, regional pilot, enterprise directory release, local publicity and implementation and pilot project implementation, formal release of guidance, continuous promotion throughout the country, project implementation and so on. Up to now, nearly 20 provinces in China have carried out the whole process engineering consulting pilot work, with thousands of pilot enterprises. At present, the whole process engineering consulting has the conditions to summarize the gains and losses of experience and explore further reform and innovation.

On the whole, the whole process of engineering consulting development and project implementation can be summarized as follows: uneven cold and heat in different places, hot in the South while cold in the north, hot in the East while cold in the west. The southern provinces and regions of China are better than the northern provinces and regions, the eastern regions are better than the western regions, especially the southeast coastal regions are just consistent with the overall economic development and the characteristics of geographical and climatic conditions of China[3].

In the consulting project consulting business, the three consulting businesses of project supervision, whole process cost consulting and project management have the highest frequency at this stage. In addition, they are bidding procurement and engineering design. The overall business distribution can be summarized as follows:

First, diversified business combinations. Most project owners prefer the two-to-two combination mode of the three businesses of whole process project management + engineering supervision + whole process cost consulting. Some project owners adopt the combination mode of engineering survey and design and the above three businesses, which is close to the architect responsibility system mode of whole process consulting.

Second, take the whole process project management as the core. The above data show that the "1+N" formula is applicable to the practice of the whole process consulting project, that is, 1 means that the whole process consulting must adhere to the whole process project management as the core, and those who do not entrust project management business cannot be called the whole process engineering consulting; In addition to project management, it also includes other 1 ~ n special consulting services (Engineering Survey and design, supervision, whole process cost consulting, etc.). From the fact that the number of engineering supervision and cost consulting businesses entrusted by the project owner is higher than the number of project management, it can be judged that some whole process consulting and bidding projects do not entrust the whole process project management, but only use the combination of "supervision + cost consulting" or combined with other special consulting businesses, and the project management adopts the "owner's own management" mode [4-5].

Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

Third, comprehensive engineering consulting units with engineering supervision qualification have advantages. Among all consulting services, the supervision business ranks first, indicating that in the whole process consulting service market, comprehensive engineering consulting units with engineering supervision qualification are the main force of the whole process consulting service at present, and this phenomenon will continue for a long time in the future[6]. At present, as the representative of Dawan district and the symbol of reform and opening up, the whole process consulting service market of large and super large government investment projects in Shenzhen has gathered top engineering consulting units with supervision qualification in China, and basically occupies a monopoly position, which fully supports the above view.

III. The EXISTING PROBLEMS IN THE WHOLE PROCESS ENGINEERING CONSULTING

3.1 Lack of Perfect Service Standard System

The traditional engineering consultation is completed by several organizations that lack contact. Due to the lack of overall communication and communication between organizations, the project management is actually in a state of division. After the introduction of the whole process engineering consulting management, some social organizations or local institutions have launched technical standards and contract model texts at the technical and commercial levels respectively, but some achievements are still a direct superposition of single consulting. There is still a lack of a perfect service standard system to standardize the service mode, consulting methods, service resources and management measures of the whole process of consulting[7-8]. Without a perfect standard system, the realization of consulting value and the release and guarantee of efficiency will hinder the development of the whole process engineering consulting service model in China.

3.2 Unclear Organizational Structure

From the macro perspective, this is a structural problem in the whole process of engineering consulting development. At present, there are three modes of whole process engineering consulting service in China, one is "1+N" mode, one is "integration" mode, and the other is "Consortium" mode. For most domestic consulting units, it is difficult to develop and establish a consulting unit that can independently contract the whole process of engineering consulting[9]. Most of them need to form a consortium to jointly bid, so a leading unit is needed to establish the whole process engineering consulting organization. If the internal relationship of individual consulting services within the consortium is not close, the benefits of individual consulting services cannot be maximized, or the inter-agency cooperation mechanism of individual consulting services is not mature and the system is not perfect, it is easy to lead to interest confrontation, and finally the comprehensiveness, integration and cross stage consulting efficiency of the whole process of consulting cannot be fully displayed[10].

Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

3.3 Insufficient Ability of Employees

The whole process engineering consulting service is an integrated management system, which puts forward great requirements for the knowledge literacy and professional level of consulting managers. The guidelines for the whole process engineering consultation issued by various regions also clearly indicate that the general person in charge of the whole process engineering consultation needs a very high professional level. At present, the quality of consulting managers in China cannot meet the professional quality required by the whole process of engineering consulting. Moreover, most domestic colleges and universities have not yet set up relevant whole process engineering consulting courses, resulting in the extreme shortage of whole process engineering consulting talents in the market. In order to promote the development of whole process engineering consulting, we must first solve the problem of shortage of whole process engineering consulting talents.

IV. PROBLEMS AND COUNTERMEASURES

4.1 Improve the Service Standard System

Carry out overall treatment for "fragmentation" engineering consulting. Jointly with social organizations and local institutions, formulate and issue relevant guiding policies, improve laws and regulations, and formulate relevant service technical standards, contract model texts, service guidelines, etc. The service standard system can determine the development direction and process of consulting services, and fundamentally avoid the loose and fragmented phenomenon of the industrial chain of traditional engineering consulting services.

Any new model has an exploration stage, and a certain development time should be given to the whole process of engineering consulting. For projects that can be better solved by the traditional engineering consulting mode, the traditional engineering consulting mode can be selected to a certain extent to avoid one size fits all. The government can also issue incentive policies to reward relevant government departments for projects promoting the whole process engineering consulting service model.

4.2 Clarify the Organizational Structure of the Consulting Organization

"1+n" mode will become the inevitable trend of the whole process consultation. Therefore, the most urgent and important problem is the "1+n" mode of the whole process consulting service. If the bidding adopts the "owner's own management" mode instead of entrusting project management and only entrusting other special consulting businesses and combinations, it does not belong to the whole process of consulting service bidding, which is a core issue related to the development direction.

There is no clear regulation on who will take the lead in the whole process of engineering consultation in China. China's current cost, supervision and design units have their own advantages in the transformation to the whole process engineering consulting. The unit with the highest

Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

qualification can be taken as the lead unit, and the project general leader and the lead unit must be the same unit, which will avoid the contradiction between the leader of the lead unit and the project general leader in the future and facilitate the development of the project.

4.3 Pay Attention to the Exploration and Training of Consulting Talents

From the national, industrial and enterprise levels, pay attention to the exploration and training of engineering consulting talents in the whole process. More meetings and courses for the training of engineering consulting talents in the whole process can be set up, and corresponding skills and job certificates can be set up to encourage more people to study in an all-round way.

V. CONCLUSION

In recent years, China has successively issued a series of documents to vigorously advocate the whole process engineering consulting model. At the same time, the whole process engineering consulting service will become the development trend of engineering consulting in the future with its advantages of integration, specialization and diversification. At present, there are some problems in the development of whole process engineering consulting in China, such as lack of service standard system, unclear organizational structure and insufficient professional ability. It is suggested that the government issue binding measures, formulate technical standard system and management standard system to meet the needs of the whole process of engineering consulting services, and provide policy support for the whole process of consulting. Consulting enterprises should scientifically plan and adjust the original organizational structure, and strengthen resource investment and talent training.

REFERENCE

[1] Rogers J, Chong H, Preece C (2015) Adoption of Building Information Modelling technology (BIM): Perspectives from Malaysian engineering consulting services firms. Engineering, Construction and Architectural Management 22(4):424-445.

[2] Ershadi M, Jefferies M, Davis P, Mojtahedi M, (2021) Project management offices in the construction industry: a literature review and qualitative synthesis of success variables. Construction Management and Economics 39(6):493-512.

[3] Pariafsai F, Behzadan AH (2021) Core Competencies for Construction Project Management: Literature Review and Content Analysis. Journal of Civil Engineering Education 147(4).

[4] Araujo AG, Pereira Carneiro AM, Palha RP(2020) Sustainable construction management: A systematic review of the literature with meta-analysis.Journal of Cleaner production 256.

[5] Tao P, Luo G(2012) Research on cost controlling and effectiveness evaluating of the whole process of engineering consulting firm. Tumu GongchengXuebao/China Civil Engineering Journal, 45(SUPPL.2):258-261.

[6] Ghodoosi F, Bagchi A, Hosseini MR, Vilutien T, Zeynalian M, (2021) Enhancement of bid decision-making in construction projects: A reliability analysis approach. Journal of Civil Engineering Education 27(3):149-161.

Forest Chemicals Review
www.forestchemicalsreview.com
ISSN: 1520-0191
September-October 2022 Page No. 1265 – 1270
Article History: Received: 06 April 2022, Revised: 28 April 2022, Accepted: 04 May 2022, Publication: 15 May 2022

[7] Jiao, Y., J. J. Finley, and B. E. Ydstie. (2022) Digital transformation of glass industry: The adaptive enterprise. Computers & Chemical Engineering, 157:107579.

[8] Koroteev, D., and Z. Tekic. (2021) Artificial intelligence in oil and gas upstream: Trends, challenges, and scenarios for the future. Energy and AI, 3:100041.

[9] Perno, M., L. Hvam, and A. Haug. (2022) Implementation of digital twins in the process industry: A systematic literature review of enablers and barriers. Computers in Industry, 134:103558.

[10] Facchini, F., S. Digiesi, and L. F. (2022) Rodrigues Pinto. Implementation of I4.0 technologies in production systems: opportunities and limits in the digital transformation. Procedia Computer Science, 200:1705-1714.